

*NSF-NASA National Astronomy
and Astrophysics Advisory
Committee (NAAAC)
Recommendations on the LSST*

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NAAAC Charter (1)

- *On a continuing basis, NAAAC will provide advice upon request to both the National Science Foundation and the National Aeronautics and Space Administration on selected issues within the field of astronomy and astrophysics of mutual interest and concern to the two agencies. Astronomy and Astrophysics is understood to encompass observations and theoretical investigations of astronomical objects and phenomena, including the sun and solar-system bodies.*
- *Four meetings per year*
- *Annual Report due at OMB by March 15th*

NAAAC Charter (2)

NAAAC activities will include assessment of and recommendations concerning:

- *The identification of gaps and duplication between the two agencies, in research and analysis programs as well as in missions, observatories, facilities, archives, etc.*
- *Advice on coordinating the development of the strategic plans of the two agencies for astronomy and astrophysics*
- *Advice on specific areas which may benefit from coordinated formulation, solicitation of proposals for research and/or hardware development, and financial support.*
- *In addition, NAAAC will conduct specialized studies when requested by the agencies. These studies will be published as reports, if appropriate.*

NAAAC Membership

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Additional members required by enabling legislation: TBD

Coordination Between NAAAC and CAA

- *CAA: Refines and promotes the strategy for the long-range plan (LRP) for astronomy*
- *NAAAC: Identifies tactical approaches to pursuing the LRP that involve inter-agency cooperation*

The April 23, 2003 NAAAC Report Identifies four major ventures that would benefit from an integrated management approach.

- *They are consistent with the LRP defined in "Astronomy and Astrophysics in the New Millennium" and "Connecting Quarks with the Cosmos.*
- *Their fulfillment requires the existence of a strong technical infrastructure*
- *Timely development requires action in FY 2005*

Understanding the formation and chemical evolution of galaxies within billion years of the Big Bang, and the formation of stars and planets

- *James Webb Space Telescope (JWST)*
- *Giant Segmented Mirror Telescope (GSMT)*

Progress on these scientific objectives is heavily dependent on GSMT being developed on the same timescale as JWST, requiring an aggressive technology development program being initiated in the FY2005 budget.

Determining the nature of the dark energy and dark matter in the Universe

- *Large Synoptic Survey Telescope (LSST)*
- *A complimentary orbiting observatory*

These perform wide-area supernova survey and cosmic gravitational lensing surveys. They should operate on comparable timescales. LSST is identified in the 2002 NRC report "New Frontiers in the Solar System: An Integrated Exploration Strategy" as a key facility for solar system science and for detecting solar system objects down to 300-m that are potentially hazardous to the Earth's biosphere. The broad interest in this program invites a coordinated implementation effort between NSF and NASA (and other interested agencies).

Potential for NASA/NSF Collaboration on LSST

LSST is the second-ranked ground based optical/infrared program of the 2000 Decadal Survey (the McKee-Taylor Committee).

- *Detection of NEO's larger than 300-meters diameter that pose a significant threat to life on Earth*
- *Variable objects (SN, gamma-ray bursts, variable stars, AGN's, microlensing events, discovery of new phenomena)*
- *Accumulation of a very deep sky image*

Probing the temporal and structural development of solar magnetic fields and activity through contemporaneous observations

- *Solar Dynamics Observatory (SDO)*
- *Advanced Technology Solar Telescope (ATST)*

The contemporaneous observations will only be realized if ATST can be put on a fast development track starting immediately.

Investigations of the polarization of the Cosmic Background Radiation (CMBR) to detect the signature of inflation using a combination of facilities

- *Wilkinson Microwave Anisotropy Probe (WMAP)*
- *Ground-based microwave telescopes at several sites*
- *Long Duration Balloon Flight payloads*

These ventures will benefit from interagency collaboration because of mutual scientific and programmatic interests, and complementary technology capabilities. They are ripe for development now. Elements of them should be included in the NSF/NASA FY 2005 budget requests to expedite early progress.

Successful pursuit of these ventures will require a strong technical infrastructure

- *Support for instrumentation development, computing, laboratory measurements, and R&A*
- *Availability of large data bases through the National Virtual Observatory (NVO)*

Ground-Based Data Archives

- *NVO is a top priority for both NASA's and NSF's astronomical science programs; Their decision to collaborate on this concept is laudable*
- *Viable archiving systems for ground-based data lag far behind such systems for space mission data*
- *NSF needs to obtain adequate resources immediately for the ground-based effort*

What is Falling Through the Cracks

- *Laboratory Astrophysics (Opportunities to involve other agencies)*
- *Theory*
- *SETI (Opportunities for public.private collaborations)*

Challenges

There is a Community perception of a clear separation of responsibility for ground-based and space-based astronomy.

- *Find opportunities where a relaxation of this traditional separation will benefit the broader strategic scientific goals of astronomy.*
- *Promote collaborations that blend ground- and space-based capabilities in joint missions that have enhanced value compared separate stand-alone missions*